

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-57 (Canceled).

58) (Currently Amended) An apparatus to traverse ~~an undersea escarpment a seabed topographic feature~~, comprising:

a subsea pipeline constructed to carry fluids across the ~~undersea escarpment topographic feature~~ between a ~~top of the escarpment first location~~ and a ~~bottom of the escarpment second location~~; wherein:

~~the topographic feature is selected from the group consisting of subsea basins, domes, valleys, cliffs, canyons, escarpments and combinations thereof;~~

said pipeline comprising at least one distributed buoyancy region;

said pipeline comprising a first unbuoyed pipeline section extending from ~~the top of the escarpment said first location~~ on a sea floor to said distributed buoyancy region and a second unbuoyed pipeline section extending from said distributed buoyancy region to the bottom of the escarpment ~~said second location~~ on ~~a~~ ~~the~~ sea floor; and

said distributed buoyancy region comprising two or more spatially arranged discrete buoyancy solutions directly attached to said distributed buoyancy region to create a positively buoyant inverse catenary section connecting said first and ~~said~~ second pipeline sections in fluid communication when said distributed buoyancy solutions are located below the waterline; and

a ~~first~~ flexure control device ~~disposed at the top of the escarpment and located between~~ said first unbuoyed pipeline section and said distributed buoyancy region ~~to reduce bending stress and strain in said first unbuoyed pipeline section, wherein the distributed buoyancy region rises above the first flexure control device at the top of the escarpment before connecting to the second unbuoyed pipeline section.~~

- 59) (Previously Presented) The apparatus of claim 58 wherein each discrete buoyancy solution comprises one or more buoyancy-providing modules disposed along a length of said pipeline.
- 60) (Previously Presented) The apparatus of claim 58 wherein each discrete buoyancy solution comprises a coating of buoyant material.
- 61) (Previously Presented) The apparatus of claim 58 further comprising a tether system to retain said pipeline in position and to resist forces of undersea currents.
- 62) (Previously Presented) The apparatus of claim 58 wherein said first and said second pipeline sections are negatively buoyant.
- 63) (Canceled)
- 64) (Currently Amended) The apparatus of claim 58 wherein the first flexure control device is located proximate to an edge of the undersea escarpment topographic feature.
- 65) (Currently Amended) The apparatus of claim 58 wherein the first flexure control device is located distant to an edge of the undersea escarpment topographic feature.

Claims 66-72 (Canceled).

- 73) (Currently Amended) A pipeline for traversing an undersea escarpment a topographic feature, comprising:
a first unbuoyed section located subsea and extending from a top of the undersea escarpment first location on the seabed;
a second unbuoyed section located subsea and extending from a bottom of the undersea escarpment second location on the seabed; and
at least one positively buoyant inverse catenary section disposed between the first and second unbuoyed sections, wherein the positively buoyant inverse catenary

section comprises two or more spatially arranged buoyancy solutions directly attached to an outer diameter thereof to provide a positively buoyant inverse catenary section when the buoyancy solutions are located below the waterline, wherein the first and second unbuoyed sections are in fluid communication with one another via the positively buoyant inverse catenary section, and wherein the at least one positively buoyant inverse catenary section traverses the undersea escarpment topographic feature, and wherein the topographic feature is selected from the group consisting of subsea basins, domes, valleys, cliffs, canyons, escarpments, and combinations thereof.

- 74) (Previously Presented) The pipeline of claim 73, wherein at least one buoyancy solution comprises one or more discrete buoyancy-providing modules.
- 75) (Previously Presented) The pipeline of claim 74, wherein the buoyancy-providing module is a buoy.
- 76) (Previously Presented) The pipeline of claim 74, wherein the buoyancy-providing module is a tethered buoy.
- 77) (Previously Presented) The pipeline of claim 73, wherein at least one buoyancy solution is a buoyant coating.
- 78) (Canceled)
- 79) (Previously Presented) The pipeline of claim 74, wherein the discrete buoyancy-providing module comprises a buoyant coating, buoy, or both.
- 80) (Currently Amended) An apparatus to traverse an escarpment located on a seabed topographic feature, comprising:

a subsea pipeline constructed to carry fluids across the escarpment topographic feature between a top of the escarpment first location and a bottom of the escarpment second location; wherein:

the topographic feature is selected from the group consisting of subsea basins, domes, valleys, cliffs, canyons, escarpments and combinations thereof;

said pipeline comprising at least one distributed buoyancy region;

said pipeline comprising a first unbuoyed pipeline section extending from the top of the escarpment said first location on a sea floor to said distributed buoyancy region and a second unbuoyed pipeline section extending from said distributed buoyancy region to the bottom of the escarpment said second location on a the sea floor; and

said distributed buoyancy region comprising two or more spatially arranged discrete buoyancy solutions directly attached to said distributed buoyancy region to create a self-supporting, positively buoyant, inverse catenary section connecting said first and said second pipeline sections in fluid communication; and

a first flexure control device disposed at the top of the escarpment and located between said first unbuoyed pipeline section and said distributed buoyancy region to reduce bending stress and strain in said first unbuoyed pipeline section; and

a second flexure control device disposed at the bottom of the escarpment and located between the second unbuoyed pipeline section and the distributed buoyancy region.

- 81) (Previously Presented) The apparatus of claim 80 wherein at least one buoyancy solution comprises a buoyancy-providing module disposed along a length of said distributed buoyancy region.
- 82) (Previously Presented) The apparatus of claim 81 wherein the buoyancy-providing module is a tethered buoy.

- 83) (Previously Presented) The apparatus of claim 80 wherein the buoyancy solutions comprise a coating of buoyant material.
- 84) (Canceled)
- 85) (Previously Presented) The apparatus of claim 80 wherein said first and said second pipeline sections are negatively buoyant.
- 86) (New) The apparatus of claim 58, further comprising a second flexure control device disposed at the bottom of the escarpment and located between the second unbuoyed pipeline section and the distributed buoyancy region to reduce bending stress and strain in the second unbuoyed pipeline section.